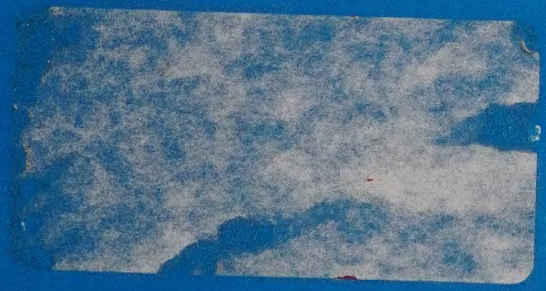
INSTRUCTION BOOK



FOR W&T EQUIPMENT

WALLACE & TIERNAN®
WALLACE & TIERNAN, INC.
25 MAIN ST., BELLEVILLE, N.J. 07109-3057

PLEASE NOTE: THIS EQUIPMENT HAS BEEN DESIGNED TO PROVIDE RELIABLE SERVICE. HOWEVER, BEFORE ATTEMPTING TO INSTALL, OPERATE, OR SERVICE THE EQUIPMENT, THIS INSTRUCTION BOOK MUST BE READ, UNDERSTOOD, AND OBSERVED. FAILURE TO DO SO CAN RESULT IN IMPROPER OPERATION WITH POSSIBLY HAZARDOUS CONSEQUENCES.

PORTABLE ELECTRO-PNEUMATIC CALIBRATOR

SERIES 65-125

BOOK NO. WCA 650.125 ISSUE B

ECN 21484 11-91

EQUIPMENT SERIAL NO. _____

DATE OF START-UP _____

START-UP BY _____

Prompt service available from regional offices in principal cities.

ORDERING INFORMATION

In order for us to fill your order immediately and correctly, please order material by description and part number, as shown in this book. Also, please specify the serial number of the equipment on which the parts will be installed.

WARRANTY

Seller warrants for a period of one year after shipment that the equipment or material of its manufacture is free from defects in workmanship and materials. Corrosion or other decomposition by chemical action is specifically excluded as a defect covered hereunder, except this exclusion shall not apply to chlorination equipment. Seller does not warrant (a) damage caused by use of the items for purposes other than those for which they were designed, (b) damage caused by unauthorized attachments or modifications, (c) products subject to any abuse, misuse, negligence or accident, (d) products where parts not made, supplied, or approved by Seller are used and in the sole judgement of the Seller such use affects the products' performance, stability or reliability, and (e) products that have been altered or repaired in a manner in which, in the sole judgement of Seller, affects the products' performance, stability or reliability. **SELLER MAKES NO OTHER WARRANTY OF ANY KIND, AND THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS OF THE MATERIAL OR EQUIPMENT FOR ANY PARTICULAR PURPOSE EVEN IF THAT PURPOSE IS KNOWN TO SELLER.** If Buyer discovers a defect in material or workmanship, it must promptly notify Seller in writing; Seller reserves the right to require the return of such defective parts to Seller, transportation charges prepaid, to verify such defect before this warranty is applicable. In no event shall such notification be received by Seller later than 13 months after the date of shipment. No action for breach of warranty shall be brought more than 15 months after the date of shipment of the equipment or material.

LIMITATION OF BUYER'S REMEDIES. The **EXCLUSIVE REMEDY** for any breach of warranty is the replacement f.o.b. shipping point of the defective part or parts of the material or equipment. Any equipment or material repaired or replaced under warranty shall carry the balance of the original warranty period, or a minimum of three months. Seller shall not be liable for any liquidated, special, incidental or consequential damages, including without limitation, loss of profits, loss of savings or revenue, loss of use of the material or equipment or any associated material or equipment, the cost of substitute material or equipment, claims of third parties, damage to property, or goodwill, whether based upon breach of warranty, breach of contract, negligence, strict tort, or any other legal theory; provided, however, that such limitation shall not apply to claims for personal injury.

Statements and instructions set forth herein are based upon the best information and practices known to Wallace & Tiernan, Inc., but it should not be assumed that every acceptable safety procedure is contained herein. Of necessity this company cannot guarantee that actions in accordance with such statements and instructions will result in the complete elimination of hazards and it assumes no liability for accidents that may occur.

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VERY IMPORTANT SAFETY PRECAUTIONS

This page titled "Very Important Safety Precautions" provides in brief, information of urgent importance relative to SAFETY in the OPERATION & MAINTENANCE of this equipment.

WARNING

TO AVOID POSSIBLE SEVERE PERSONAL INJURY OBSERVE THE FOLLOWING PRECAUTIONS:

IMPROPER USE OF THIS CALIBRATOR MAY CAUSE EXPLOSION AND PERSONAL INJURY. READ INSTRUCTION BOOK BEFORE USING THIS EQUIPMENT.

DO NOT APPLY PRESSURE IN EXCESS OF 60 PSI TO THE FILTER. OVERPRESSURE MAY RESULT IN POSSIBLE EXPLOSION AND PERSONAL INJURY.

OVERPRESSURE SHOULD BE AVOIDED SINCE IT CAN CAUSE CALIBRATION CHANGE, DAMAGE TO THE ELASTIC ELEMENT AND TRANSDUCER, FILTER FAILURE AND POSSIBLE PERSONAL INJURY.

DO NOT USE LIQUIDS. LIQUIDS WILL CAUSE INACCURATE READINGS.

TO AVOID INJURY FROM ELECTRICAL SHOCK OR HIGH TEMPERATURE, AVOID CONTACT WITH INTERNAL COMPONENTS WHEN POWER IS ON.

TO ENSURE PROPER AND SAFE OPERATION OF THIS EQUIPMENT, USE ONLY W&T LISTED PARTS EXCEPT COMMERCIALLY AVAILABLE PARTS AS IDENTIFIED BY COMPLETE DESCRIPTION ON PARTS LIST. THE USE OF UNLISTED PARTS CAN RESULT IN EQUIPMENT MALFUNCTIONS CAUSING POSSIBLE SEVERE PERSONAL INJURY.

DO NOT DISCARD THIS INSTRUCTION BOOK UPON COMPLETION OF INSTALLATION. INFORMATION PROVIDED IS ESSENTIAL TO PROPER AND SAFE OPERATION AND MAINTENANCE.

ADDITIONAL OR REPLACEMENT COPIES OF THIS INSTRUCTION BOOK ARE AVAILABLE FROM:

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NOTE

Minor part number changes may be incorporated into W&T products from time to time that are not immediately reflected in the instruction book. If such a change apparently has been made in your equipment and does not appear to be reflected in your instruction book, contact your local W&T sales office for information.

Please include the equipment serial number in all correspondence. It is essential for effective communication and proper equipment identification.

INTRODUCTION

This instruction book provides operation and maintenance instruction for the Wallace & Tiernan Series 65-125 Portable Electro-Pneumatic Calibrator. This equipment is designed primarily for field checking and calibration of electro-pneumatic and pneumatic controls and instrumentation. In most cases the gauge, recorder or other device being checked need not be removed from its mounting or operation location.

> **WARNING:** TO AVOID POSSIBLE SEVERE PERSONAL INJURY OR DAMAGE TO THE EQUIPMENT, THIS EQUIPMENT SHOULD BE INSTALLED, OPERATED AND SERVICED ONLY BY TRAINED, QUALIFIED PERSONNEL WHO ARE THOROUGHLY FAMILIAR WITH THE ENTIRE CONTENTS OF THIS INSTRUCTION BOOK.

The Series 65-125 Calibrator consists of a carrying case containing an aluminum panel on which are mounted a precision digital indicator, a pneumatic connection block, selector valve, various pressure regulating devices, a power switch, electrical input and output terminals and three selection switches. A graphic flow diagram on the panel clearly shows the pneumatic connections between the various units. A rechargeable battery pack is provided to permit the unit to operate for a minimum of six hours independent of a line power connection.

The solid state electronics include a precision integrated silicon strain gauge diaphragm transducer.

> **WARNING:** IMPROPER USE OF THIS CALIBRATOR MAY CAUSE EXPLOSION AND PERSONAL INJURY. READ INSTRUCTION BOOK BEFORE USING THIS EQUIPMENT.

The following general and safety related information on the installation and use of pressure gauges has been excerpted from ANSI B40.1-1974, GAUGES PRESSURES & VACUUM - indicating Dial Type - Elastic Element. The complete standard may be obtained from the AMERICAN SOCIETY OF MECHANICAL ENGINEERS, United Engineering Center, 345 East 47th St., New York, N.Y. 10017.

2.0 DEFINITIONS

2.1 Basic Gauge Classifications

2.1.1 Pressure Gauge. A gauge to measure and indicate pressure greater than ambient* using ambient pressure as the datum point.

2.1.2 Vacuum Gauge. A gauge to measure and indicate pressure less than ambient* using ambient pressure as the datum point.

2.1.3 Compound Gauge. A gauge to measure and indicate pressure both greater than and less than ambient* pressure as the datum point.

2.1.4 Absolute Pressure Gauge. A gauge to measure and indicate pressure above zero absolute pressure, using absolute zero pressure as the datum point.

2.1.5 Single Gauge. A gauge having one elastic element, one connection, and a means of measure and indicate one pressure or vacuum.

* Ambient pressure is the pressure surrounding the measuring element.

2.1.6 Duplex Gauge. A gauge having two independent elastic elements, two independent connections and a means to measure and indicate two independent pressure or vacuum.

2.1.7 Differential Gauge. A gauge having two connections and a means to measure and indicate the difference between the two pressures.

2.3 Application Conditions (see Section 4.0)

2.3.6 Overpressure. The application of the pressure beyond the full scale pressure.

WARNING: OVERPRESSURE SHOULD BE AVOIDED SINCE IT CAN CAUSE CALIBRATION CHANGE, DAMAGE TO THE ELASTIC ELEMENT AND TRANSDUCER, FILTER FAILURE AND POSSIBLE PERSONAL INJURY.

3.2 Operating Parameters

3.2.3 Caution to Users. Pressure gauges can be rendered inaccurate during shipment despite care taken in packaging. To insure conformance to the (standards) to which the pressure gauge was manufactured, it should be checked before use.

4.0 SAFETY

4.1 Scope

This section of the standard presents information to guide users, suppliers and manufacturers toward minimizing the hazards that could result from misuse or misapplication of pressure gauges with elastic elements.

Adequate safety results from intelligent planning and careful selection and installation of gauges into a pressure system. The user should inform the supplier of all conditions pertinent to the application and environment so that the supplier can recommend the most suitable gauge for application.

4.2 General Comments

4.2.1 The history of safety with respect to the use of pressure gauges has been excellent. Injury to personnel and damage to property have been minimal. In most instances, the cause of failure has been misuse or misapplication.

4.2.2 The pressure sensing element in most gauges is subjected to high internal stresses, and applications exist where the possibility of catastrophic failure is present. Pressure regulators, chemical seals, pulsation dampers or snubbers, syphons, etc., are available for use in these potentially hazardous systems.

4.2.3 Pressures in excess of full scale pressure (or vacuum) should not be applied unless recommended by the gauge manufacturer.

4.2.4 The window material alone will not provide adequate protection against internal case pressure build-up and can, in fact, be the most hazardous component.

4.2.5 The following systems are considered potentially hazardous and must be carefully evaluated:

1. Compressed gas systems
2. Oxygen systems
3. Systems containing hydrogen or free hydrogen atoms
4. Corrosive fluid systems (gas and liquid)
5. Pressure systems containing any explosive or flammable mixture or medium.
6. Steam systems
7. Non-steady pressure systems
8. Systems where high overpressure could be accidentally applied.
9. Systems where interchangeability of gauges could result in hazardous internal contamination or where lower pressure gauges could be installed in higher pressure systems.
10. Systems containing radioactive or toxic fluids.
11. Systems installed in a hazardous environment (see Appendix II, paragraph (C).

4.2.6 When the gauges are to be used in contact with media having known or uncertain corrosive effects or known to be radioactive, random or unique destructive phenomena can occur. In such cases the user should always furnish the supplier or manufacturer with information relative to the application and solicit his advice prior to installation of the gauge.

4.2.7 Fires and explosion within a pressure system can cause pressure element failure with very violent effects, even to the point of completely disintegrating or melting the pressure gauge. Violent effects are also produced when failure occurs due to (1) hydrogen embrittlement, (2) contamination of a compressed gas, (3) formation of acetylides, (4) melting of soft solder joints by steam or other heat sources, (5) corrosion, (6) fatigue, (7) the presence of shock, and (8) excessive vibration. Nearly any failure in a compressed gas system produces violent effects.

4.4.2 Pressure Element

4.4.2.2 Pressure element assemblies are usually joined by soft soldering, silver brazing, or welding. When pressure element joints will be subjected to installed operational temperatures in excess of the values listed below, the user shall furnish detailed information relative to the application and solicit the advice of the gauge supplier prior to its installation.

Soft Soldered..... -20°F to +120°F
Silver Brazed..... -20°F to +250°F
Welded..... -20°F to temperature limits of metals being used.

End of Excerpt of ANSI B40.1-1974

1 COMPONENT DESCRIPTION

1.1 DIGITAL INDICATOR

The indicator is a 4-1/2 digit liquid crystal display with a maximum full scale count of 19999. Depending upon the various selector switch settings it is used to display all of the electrical and pneumatic measurements.

1.2 POWER SWITCH

A rocker style switch applies power to energize the calibrator whether the unit is running off the power line or from the internal batteries.

1.3 SELECTOR SWITCHES

The Mode Select switch setting determines whether DC milliamperes, DC voltage, or pressure measurements are displayed by the digital indicator.

When the Mode Select switch is in the "pressure" position the Pressure Scale Select switch determines the range and units of measure to be displayed.

When the calibrator is used to drive an external electronic instrument loop the Transmitter Power Select switch is used to select either a nominal 24 volt or 48 volt supply.

1.4 SELECTOR VALVE

The selector valve permits only one of any three pressures to be applied to the high pressure side of the sensor. A fourth position permits venting pressure from the sensor to atmosphere.

1.5 AIR FILTER

The air filter mounted under the panel is easily replaceable and protects the various components if the air supply is of less than instrument air quality.

WARNING: TO AVOID POSSIBLE SEVERE PERSONAL INJURY, DO NOT APPLY PRESSURE IN EXCESS OF 90 PSI TO THE FILTER.

1.6 PRECISION PRESSURE REGULATORS

The two precision pressure regulators accept supply air pressure through the filter and regulate the P1 and P2 outputs. These are used in applying known pressures to pneumatic control devices.

1.7 HAND PUMP

This is used to pressurize pneumatic systems being tested when an external source of pressure is not available. This pressurizes only the P3 output.

1.8 VOLUME CONTROL

This is used in conjunction with the hand pump for fine trimming of the pressure in closed systems connected to the P3 output.

1.9 VENT VALVE

This is used for venting the P3 output.

1.10 ACCESSORIES

Furnished with the calibrator are six couplings, U16052, for 1/8-inch pipe thread to 1/4-inch OD plastic tubing and 20 feet of 1/4-inch OD plastic tubing, RP68-4441 and a power cord.

1.11 CASE

The lid of the carrying case may be removed for convenience.

2 CARE OF INSTRUMENT

This calibrator is a precision instrument. It has been just as ruggedly constructed as the service for which it is intended will permit, and every precaution has been taken to prevent it getting out of adjustment when subjected to vibration and shock. As a matter of good practice, however, the instrument should be handled with care and protected against violent and sudden jolts.

This instrument is intended for use with dry non-corrosive gas. The mechanism does not require lubrication.

3 TECHNICAL DATA

Accuracy:	Pressure and percent current: 0.1% F.S. including repeatability, nonlinearity, and hysteresis error. Voltage: Better than ± 0.03V below 30V ± 0.1% of reading 30V and above
Operating Temperature:	-10°C to 50°C
Temperature Effect:	Span change will be less than ± 0.02% of reading per 1°C over a temperature range of 10°C to 30°C
Speed of Response:	Zero to full scale in 2 seconds
Overpressure Capability:	60 psi (see paragraph 4.1 for precautions)
Warm-up Time:	Two minutes, typical
Position Effect:	Negligible
Power Supply:	115 Vac, 50/60 Hz, approx. 4 watts
Readout:	4-1/2 digit, 3/8-inch high, 7 segment LCD display
Pressure Connections:	1/8 NPT Female
Carrying Case:	ABS Plastic 17-1/2 inches x 12 inches x 7-1/2 inches
Shipping Weight:	26 lb (21 lb net)

4 OPERATION OF THE INSTRUMENT

If the calibrator is to be operated from the power line, plug the line cord into the receptacle on the side of the case and into a suitable 115 volt, 50/60 Hz outlet.

Place the rocker switch to an "ON" position. If the unit is being operated from the battery supply and the display is blank, the batteries must be recharged prior to use.

4.1 PRECAUTIONS

a. When ever the transmitter power output feature is not being used the "Transmitter Power Select" switch should be left in the "OFF" position.

b. Do not subject the instrument to pressure beyond its range. This can easily be controlled by the proper setting of the supply tank pressure regulators. Pressure relief valves have been installed to protect the mechanism in the event of air regulator failure. These relief valves are set to provide protection for pressures up to 90 psi.

c. Unless wide temperature changes are experienced, the effect of temperature may be neglected. Therefore, do not install the instrument near a source of heat or cold. For pressure measurements the temperature error is less than 0.02% of reading per 1°C. The temperature allowance represents the maximum possible error due to temperature. Because the actual error is usually less, the temperature allowance is not a correction factor.

CAUTION: DO NOT use the calibrator for liquid service. Damage to the calibrator will result.

4.2 OPERATION

The details of some typical uses of the calibrator are given below.

a. Measurement Of Gauge Pressure From An External Source

1) Place "Mode Select" switch to the "Pressure" position.

2) Place "Pressure Scale Select" to the desired scale.

3) Adjust the "Zero Trim" control to a reading of 00.00. (If using the Percent scale set to -25.00).

4) Leave the "S" port open to the atmosphere.

5) Close the "Vent Valve" (turn fully clockwise).

6) Connect the pressure to be measured to port "P3".

7) Turn the selector valve to the P3 position.

8) The display reads gauge pressure.

b. Calibration Of Pressure Gauges With Air

1) Place "Mode Select" switch to the "Pressure" position.

2) Place "Pressure Scale Select" to the desired scale.

3) Adjust the "Zero Trim" control to a reading of 00.00 (If using the Percent scale set to -25.00).

4) Connect AIR SUPPLY to a source of air pressure between 40 and 90 psig.

5) Connect the gauge to be calibrated to port "P1" or "P2" with flexible tubing, or if gauge is small enough and has a 1/8-inch NPT male thread, screw gauge directly into connection block at P1 or P2.

6) Turn selector valve to the appropriate position (P1 or P2).

7) Turn the appropriate regulator knob counterclockwise until no spring load remains.

8) Turn on the air supply and adjust the pressure as desired with the regulator and compare the digital display with the reading of the gauge under test.

c. Measurement Of Differential Pressure From External Sources

1) Place "Mode Select" switch to the "Pressure" position.

2) Place "Pressure Scale Select" to the desired scale.

3) Adjust the "Zero Trim" control to a reading of 00.00. (If using the Percent scale set to -25.00).

4) Close the "Vent Valve" (turn fully clockwise).

5) Connect high side of the differential pressure to be measured to port "P3".

6) Turn the selector valve to the P3 position.

7) Apply the reference pressure (never exceeding 35 psi) to the port "S".

8) The display reads the differential pressure.

d. Measurement Of Absolute Pressure From An External Source

1) Place "Mode Select" switch to the "Pressure" position.

2) Place "Pressure Scale Select" to the desired scale.

3) Adjust the "Zero Trim" control to a reading of 00.00 (If using the Percent scale set to -25.00).

4) Close the "Vent Valve" (turn fully clockwise).

5) Connect a vacuum pump to port "S" and evacuate the back side of the sensor.

6) Connect the pressure to be measured to the port "P3".

7) Turn the selector valve to the P3 position.

8) The display reads the absolute pressure.

e. Calibration Of A Pneumatic Controller In Which The Applied Set And Variable Pressures Result In An Output Pressure Which Is A Function Of The Other Two Pressures

1) Place "Mode Select" switch to the "Pressure" position.

2) Place "Pressure Scale Select" to the desired scale.

3) Adjust the "Zero Trim" control to a reading of 00.00 (If using the Percent scale set to -25.00).

4) Close the "Vent Valve" (turn fully clockwise).

5) Connect AIR SUPPLY to a source of pressure between 40 and 90 psig.

6) Connect port "P1" to the SET pressure connection on the control device.

7) Connect port "P2" to the PROCESS VARIABLE pressure connection on the control device.

8) Connect port "P3" to the OUTPUT connection on the control device.

9) Turn both regulator knobs counterclockwise until no spring loads remain.

10) Turn on the air supply.

11) Turn the selector valve to position P1 and adjust Regulator 1 until the SET pressure read on the calibrator is the value required by the control device.

12) Turn the selector valve to position P2 and using Regulator 2 set the PROCESS VARIABLE at some value near one end of the variable pressure range.

13) Turn the selector valve to position P3. The display will show the resulting OUTPUT pressure.

14) Repeat steps 12 and 13 as many times as desired to cover the range of PROCESS VARIABLES pressure.

f. Adjustment Of Any Pneumatic Device In Which The Difference Between Two Signals Should Be Zero Or Some Value Not Exceeding The Range Of The Calibrator

1) Place "Mode Select" switch to the "Pressure" position.

2) Place "Pressure Scale Select" to the desired scale.

3) Adjust the "Zero Trim" control to a reading of 00.00 (If using the Percent scale set to -25.00).

4) Close the "Vent Valve" (turn fully clockwise).

5) Connect the two signals to ports "P3" and "S" respectively with the higher pressure going to "P3".

NOTE: The signal applied to "S" should not exceed 35 psig.

6) Turn the selector valve to position P3.

7) Turn on the two signals simultaneously if possible. Otherwise turn on the signal to "P3" first.

g. Calibrating Vacuum Gauges

1) Place "Mode Select" switch to the "Pressure" position.

2) Place "Pressure Scale Select" to the desired scale.

3) Adjust the "Zero Trim" control to a reading of 00.00 (If using the Percent scale set to -25.00).

4) Set the selector valve to "Vent".

5) Install a tee in port "S" and connect one leg to a vacuum source and the other to the gauges which are to be calibrated.

6) Install a shut-off valve at the vacuum source. Tee into the line between this shut-off valve and the calibrator with a bleed valve.

7) Compare the calibrator readings with the vacuum gauge readings.

h. Applying Calibrated Pressure To An External Device Using The "Hand Pump" And "Volume Control"

1) Place "Mode Select" switch to the "Pressure" position.

2) Place "Pressure Scale Select" to the desired scale.

3) Adjust the "Zero Trim" control to a reading of 00.00 (If using the Percent scale set to -25.00).

4) Leave the "S" port open to the atmosphere.

5) Close the "Vent Valve" (turn fully clockwise).

6) Connect the external device to be calibrated to port "P3".

7) Turn the selector valve to position P3.

8) Using the "Hand Pump" pressurize the system to approximately the desired pressure.

9) Use the "Volume Control" adjustment to achieve the exact calibrator pressure desired.

10) When the measurement is completed open the "Vent Valve" (turn counter-clockwise).

i. Measuring DC Voltage

1) Place the "Mode Select" switch to the "0-200 Volts DC" position.

2) Connect the voltage to be measured to the "Volts DC In" terminals.

3) Read the measured voltage on the display.

NOTE: If the negative terminal on the "volts DC in" pair is more positive than the positive terminal, the display will indicate that a negative voltage have been measured.

j. Measuring DC Current (in percent)

1) Place the "Mode Select" switch to the desired "Percent" current position.

2) Connect the current to be measured to the "Milliamps DC In" terminal pair.

3) Read the current measured (as a percent of full range) on the display.

NOTE: If the direction of current flow is reversed, the display will indicate a negative, erroneous value.

k. Using The Transmitter Power For Loop Driving

1) Place the "Transmitter Power Select" switch to the "Off" position.

2) Observing polarity, connect the loop to be powered to the desired transmitter power terminal pair.

3) Place the "Transmitter Power Select" switch to the desired position.

NOTE: When using either the 24 or 48 VDC transmitter power output the maximum current should be limited to 50 mA.

l. Battery Use

The calibrator is equipped with a rechargeable battery pack to permit operation independent of 115 volt AC power. If the batteries are completely charged they contain sufficient energy to operate the calibrator and supply 50 mA to an external load for at least six hours. With no external load, the calibrator will operate at least 300 hours on battery power. Since the calibrator can be operated while the batteries are recharging, it is recommended that it be run using line power whenever possible to keep the batteries fully charged. However, to avoid loss of battery capacity due to the memory effect of nickel/cadmium batteries to long periods of low output, they should be allowed to drain completely every few months. The batteries will be recharged in 14 to 16 hours. Low battery condition is indicated by a flashing display.

5 SERVICE

WARNING: TO AVOID POSSIBLE SEVERE PERSONAL INJURY FROM ELECTRICAL SHOCK OR HIGH TEMPERATURE, AVOID CONTACT WITH INTERNAL COMPONENTS WHEN POWER IS ON.

5.1 PRECISION PRESSURE REGULATOR

The regulator is Model GH10XT2379C (0-30 psi) purchased as a unit from Conoflow Corp. Wallace & Tiernan does not stock parts for this regulator and if any are needed, the manufacturer should be consulted. Be sure to specify the range as stamped on the bottom of the regulator.

5.2 AIR FILTERS

Replace Koby air filter U28021 at regular intervals depending on the quality of the air supply and the frequency with which the calibrator is used. See label L1809 (1, 650.125.000.010) for recommendations.

Clean the filter screen, built into the connector adapter (94), at the "S" port, when the screen is visibly dirty. Remove adapter (94) from connecting block (13) before cleaning the filter screen to prevent dirt from falling into the tubing connected to the adapter (94).

5.3 FUSES

If the milliamp input or milliamp output functions are inoperative, the most likely cause is a blown fuse. Access to the fuse is achieved by removing the aluminum front panel.

The milliamp input fuse, F2, P58236 (100 mA, "FAST-ACTING"-Littelfuse #312.100) is on the display circuit board. A similar 1/8 ampere fuse may also be used.

The milliamp output fuse, P57254 (3/4 ampere, "FAST-ACTING"-Littelfuse #312.750) is on the power supply circuit board.

Fuse F1, on the display circuit board, limits fault current in the power supply cable to the display board. F1 is the same fuse as F2, the milliamp input fuse.

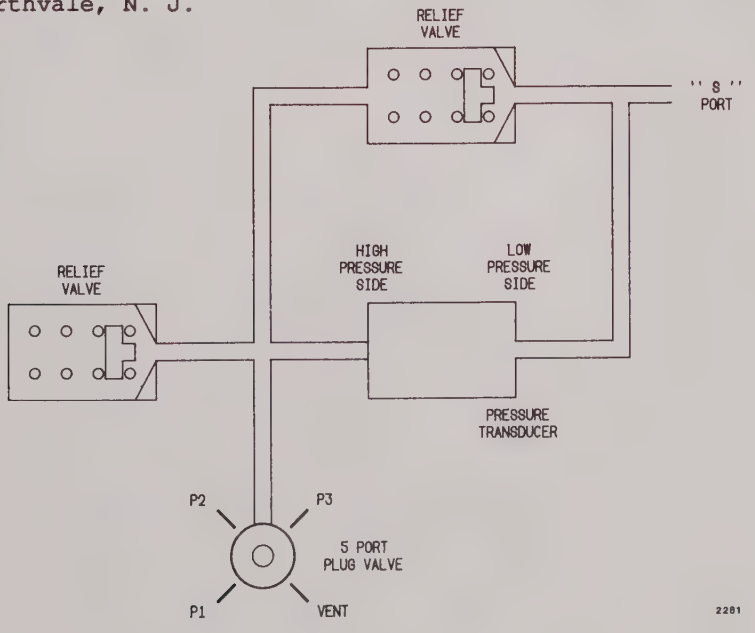
The fuse in the fuse holder, mounted in the side of the carrying case, next to the line cord connection, limits fault current in the line cord. The fuse P49146 is a 1/2 ampere fuse (type 3 AG, "SLO-BLO", Littelfuse #313.500).

5.4 BATTERY PACK

The battery pack, U27817, consists of eight series connected nickel/cadmium "D" cells. This is not a user serviceable component. Should the batteries no longer hold their charge, the pack must be replaced.

5.5 LEAKS (See Dwg. 650.125.000.010)

Small leaks in the "P3" (103) and "S" pressure systems will make accurate pressure readings difficult to obtain. Leaks to the atmosphere can be located by using a foaming liquid such as Leak-Tec ® from American Gas and Chemical Co., Northvale, N. J.



Internal leaks across the pressure tranducer (62) can occur when the "S" port is over pressured. This causes the protective relief valve (52) to open and allows foreign material to lodge under the relief valve's O-ring. The relief valve should be removed, disassembled and cleaned.

A filter screen built into the connector adapter (94) at the "S" port prevents most foreign material from entering the pressure system on the calibrator side of the "S" port.

5.6 CALIBRATION

CAUTION: RV1 adjusts the reference voltage to the A/D integrated circuit. Any change will cause a span change to all scales. The reference voltage should be 1.0000 volts at TP1V.

The voltage scale can not be adjusted.

Span of the milliamp scales can not be adjusted.

The -25% point at zero input on the milliamp and %3-15 psi scales are adjusted by RV2. Adjustment of RV2 causes a zero shift of the milliamp and %3-15 psi scales.

Span of the in. Hg scale is adjusted by RV5.

Span of the in. H_2O scale is adjusted by RV6.

Span of the %3-15 psi scale is adjusted by RV7.

Span of the 30 psi scale is adjusted by RV8.

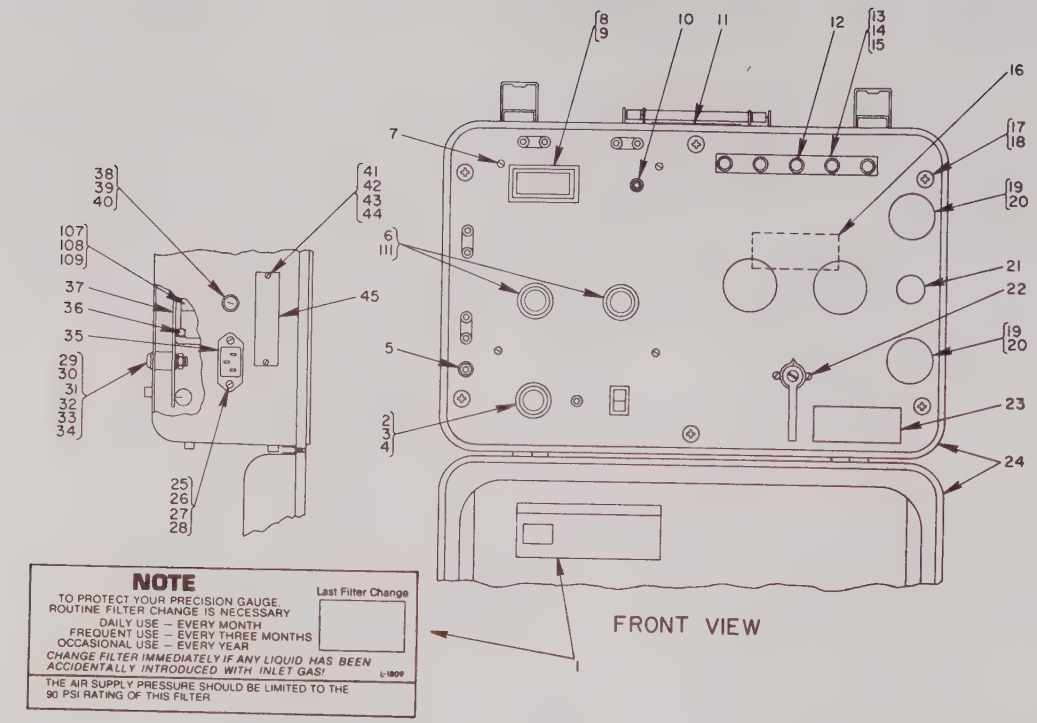
Do not disturb RV4 and RV9. They adjust pressure scale linearity and display brightness, respectively.

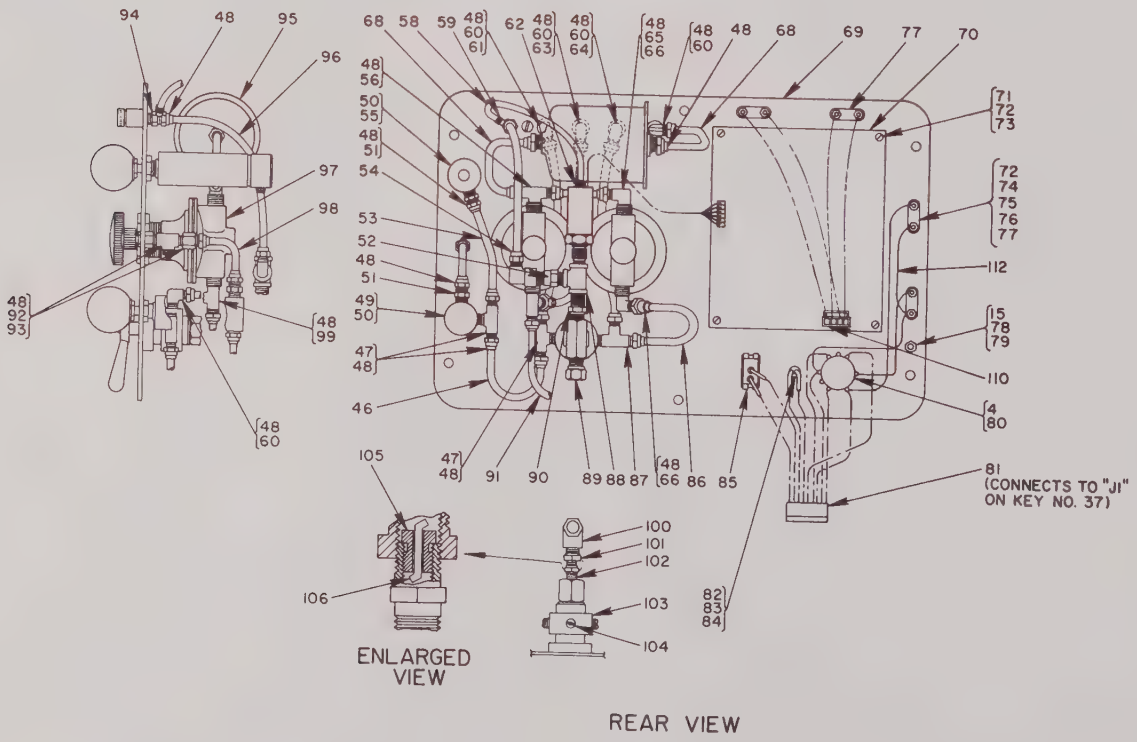
WARNING LABELS AND TAGS

The following warning labels and tags have been attached to the equipment and are listed below.

L2228: READ INSTRUCTION MANUAL BEFORE OPERATING, SERVICING OR CONNECTING THIS EQUIPMENT TO A PRESSURE SOURCE.

L2295: TO PREVENT POSSIBLE PERSONAL INJURY FROM ELECTRICAL SHOCK OR HIGH TEMPERATURE, AVOID CONTACT WHEN POWER IS ON.


NOTE
TO PROTECT YOUR PRECISION GAUGE,
ROUTINE FILTER CHANGE IS NECESSARY
DAILY USE – EVERY MONTH
FREQUENT USE – EVERY THREE MONTHS
OCCASIONAL USE – EVERY YEAR
CHANGE FILTER IMMEDIATELY IF ANY LIQUID HAS BEEN ACCIDENTALLY INTRODUCED WITH INLET GAS!
Last Filter Change
THE AIR SUPPLY PRESSURE SHOULD BE LIMITED TO THE 90 PSI RATING OF THIS FILTER
FRONT VIEW



NOTE: FOR PARTS LIST SEE DWG. NO. 650.125.000.010B

WHEN ORDERING MATERIAL ALWAYS SPECIFY MODEL AND SERIAL NUMBER OF APPARATUS

SERIES 65-125 ELECTRONIC PNEUMATIC CALIBRATOR – PARTS

650.125.000.010A
ISSUE 3 5-90

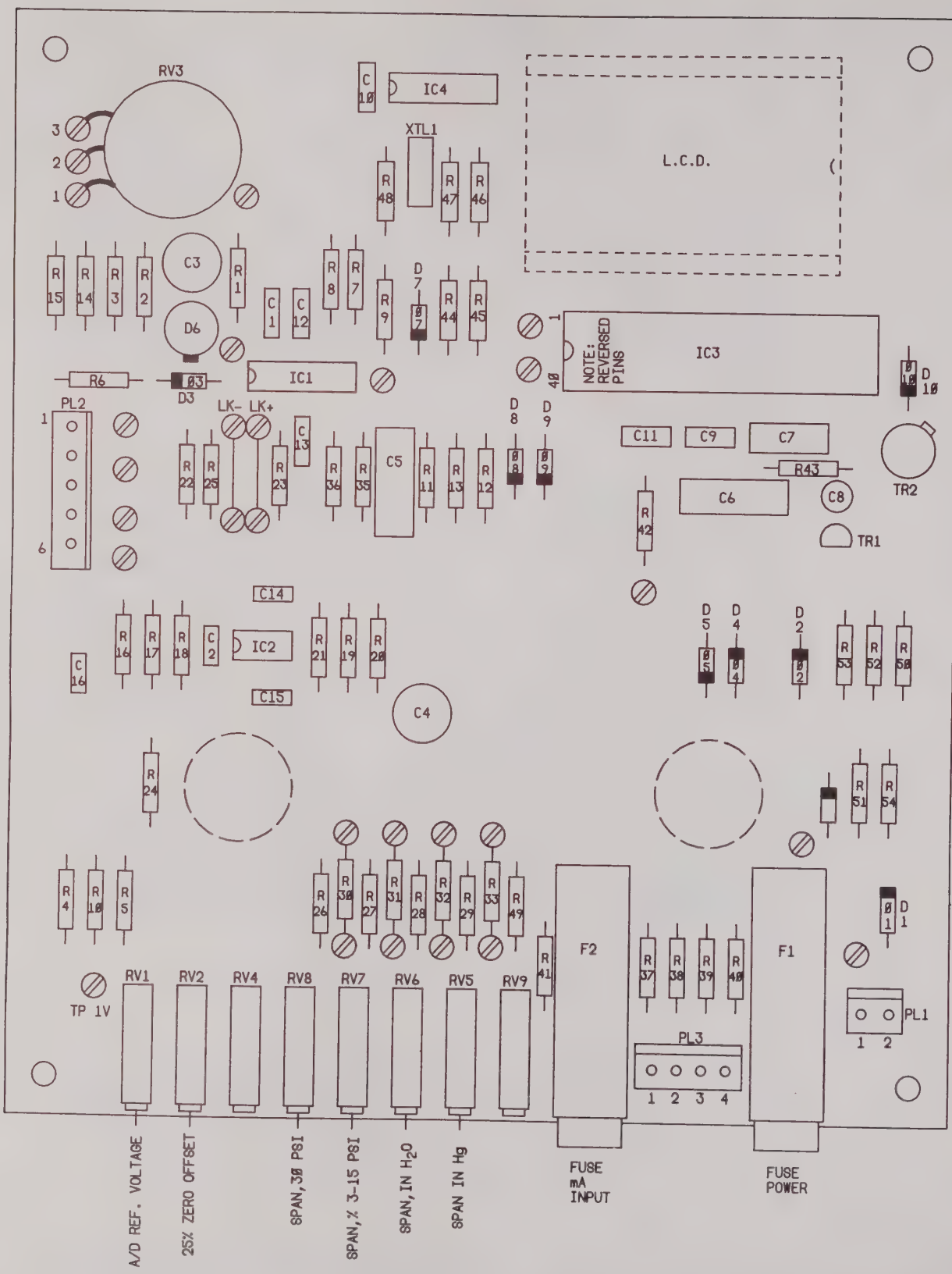
KEY NO.	PART NO.	QUANTITY	DESCRIPTION
1	L 1809	1	FILTER LABEL
2	P 54000	1	KNOB
3	P 52802	1	5/8" SHAKEPROOF LOCKWASHER (BRONZE)
4	P 38893	2	HEX NUT (BRASS) 3/8"-32
5	P 57337	1	GROUNDING POST
6	P 57509	2	SELECT SWITCH KNOB
7	P 57496	4	MACH.SCREW (OVAL HD.,S.S.) #6-32 x 5/16" LG.
8	P 57280	1	BEZEL
9	P 57281	1	FILTER
10	P 57508	1	ZERO ADJUSTMENT KNOB
11	P 58743	1	LOGO LABEL
12	U 20037	5	PLUG AND GASKET
13	FP 9923	1	CONNECTION BLOCK
14	PN 6938	2	MACH.SCREW (RD.HD.,BRASS) #10-32 x 7/16"LG.
15	P 13619	3	#10 LOCKWASHER (S.S.)
16	L 2295	1	WARNING LABEL
17	P 43283	6	MACH.SCREW (TRUSS HD.,S.S.)1/4"-20 x 1/2"LG.
18	P 56002	6	RETAINER NUT
19	P 57490	2	KNOB
20	P 57492	2	HEX NUT (S.S.) 5/16"-24
21	P 57507	1	VALVE KNOB
22	PN 5988	2	MACH.SCREW (OVAL.HD.,BRASS) #8-32 x 1/2" LG.
23	L 2228	1	WARNING LABEL
24	FUXA 4876	1	CASE
25	P 40922	2	MACH.SCREW (PAN.HD.,S.S.) #4-40 x 3/8" LG.
26	P 40894	2	HEX NUT (S.S.) #4-40
27	P 41942	2	#4 WASHER (S.S.)
28	P 15362	2	#4 LOCKWASHER (S.S.)
29	P 57291	4	MACH.SCREW (PAN.HD.,S.S.) 1/4"-20 x 5/16"LG.
30	P 19888	4	1/4" WASHER (S.S.)
31	P 57255	4	SHOCK MOUNT (S.S.) 1/4"-20
32	P 19835	4	HEX NUT (S.S.)
33	P 50263	4	1/4" WASHER (S.S.)
34	P 29713	4	1/4" SHAKEPROOF LOCKWASHER (S.S.)
35	FU 5291	1	RECEPTACLE UNIT
36	P 57254	1	FUSE, 3/4 AMP (3 AG FAST ACTING)
37	FU 5278	1	POWER SUPPLY CIRCUIT BOARD
38	U 27616	1	FUSE HOLDER
39	P 49146	1	FUSE, 1/2 AMP (3 AG SLO-BLO)
40	P 42106	1	1/2" SHAKEPROOF LOCKWASHER (S.S.)
41	FP 2420	2	MACH.SCREW (PAN.HD.,S.S.) #2-56 x 1/4" LG.
42	P 43659	2	HEX NUT (S.S.) #2-56
43	PN 17860	2	#2 WASHER (BRASS)
44	P 13000	2	#2 LOCKWASHER (S.S.)
45	P 12164	1	NAMEPLATE
46	RP68 4441	4-1/2"	TUBING, 1/4" OD (POLYETHYLENE)
47	P 52411	2	TEE (BRASS) 1/4" TUBE x 1/4" TUBE x 1/8"NPT
48	P 34439	21	TUBING SLEEVE AND NUT
49	U 27930	1	CHAMBER
50	P 5882	2	HEX NUT (BRASS) 5/8"-18
51	P 52409	2	CONNECTOR (BRASS) 1/4" TUBE x 1/8" NPT
52	U 27614	1	RELIEF VALVE
53	RP68 4441	4"	TUBING, 1/4"OD (POLYETHYLENE)
54	U 20523	1	ELBOW (BRASS) 1/4" TUBE x 1/8" NPT (FEMALE)
55	U 27931	1	PUMP
56	P 52414	1	TEE (BRASS) 1/4" TUBE x 1/4" TUBE x 1/4"NPT
58	RP61 4413	9-5/8"	TUBING, 1/16"ID (NYLON)
59	FP 10239	2	HOSE CLAMP
60	P 52410	5	ELBOW (BRASS) 1/4" TUBE x 1/8" NPT
61	RP68 4441	6-1/2"	TUBING, 1/4" OD (POLYETHYLENE)
62		1	TRANSDUCER (PART OF KEY NO. 70)
63	RP68 4441	7"	TUBING, 1/4" OD (POLYETHYLENE)
64	RP68 4441	6-3/4"	TUBING, 1/4" OD (POLYETHYLENE)
65	RP68 4441	2"	TUBING, 1/4" OD (POLYETHYLENE)
66	P 52413	2	ELBOW (BRASS) 1/4" TUBE x 1/4" NPT
68	FP 10313	2	TUBING, 1/4" (COPPER)
69	FP 10300	1	MOUNTING PANEL
70	FU 5271	1	DISPLAY CIRCUIT BOARD
71	P 57495	4	SPACER
72	P 13662	12	#6 LOCKWASHER (S.S.)
73	P 40037	4	MACH.SCREW (PAN.HD.,S.S.) #6-32 x 5/16" LG.
74	P 57339	4	BINDING POST
75	P 57340	4	BINDING BASE
76	P 19865	8	#6 WASHER (S.S.)
77	P 19822	16	HEX NUT (S.S.) #6-32
78	P 57338	1	SPECIAL WASHER
79	P 19646	2	HEX NUT (S.S.) #10-32
80	U 27592	1	ROTARY SWITCH (PART OF KEY NO. 81)
81	FU 5276	1	WIRE HARNESS (9 CONDUCTOR)
82	P 53497	1	CLIP
83	P 53498	1	RING
84	P 56843	1	LAMP
85	P 57211	1	ROCKER SWITCH
86	RP68 4441	6-1/2"	TUBING, 1/4"OD (POLYETHYLENE)
87	U 21627	1	TEE (BRASS) 1/4" TUBE x 1/4" TUBE x 1/8"NPT
88	P 694	1	TEE (BRASS) 1/8" NPT
89	U 27954	1	RELIEF VALVE
90	P 627	1	NIPPLE, 1/8" NPT x 3/4" LG.
91	RP68 4441	7-1/4"	TUBING, 1/4" OD (POLYETHYLENE)
92	U 27596	1	NEEDLE VALVE
93	P 57233	1	CONNECTOR (BRASS) 1/4" TUBE x 1/8" NPT
94	U 27932	1	MALE CONNECTOR ADAPTER
95	U 28021	1	AIR FILTER
96	RP68 4441	7-1/2"	TUBING, 1/4" OD (POLYETHYLENE)
97	U 18713	2	REGULATOR
98	RP68 4441	2-1/2"	TUBING, 1/4" OD (POLYETHYLENE)
99	P 52407	1	TEE (BRASS) 1/4" TUBE x 1/4" NPT x 1/4"TUBE
100	P 49289	1	TEE (BRASS) 1/4" NPT
101	P 686	2	REDUCING BUSHING (BRASS) 1/4"TUBE x 1/8"NPT
102	P 47942	1	ADAPTER
103	U 20030	1	5 PORT VALVE
104	FU 3523	1	FILTER UNIT
105	PXA 38519	1	SPECIAL SCREW
106	P 36618	1/2"	WIRE, 1/32" DIA. (COPPER)
107	U 27817	1	BATTERY PACK
108	P 57488	2	MACH.SCREW (PAN.HD.,S.S.) #10-32 x 3" LG.
109	PC 33470	2	#10 WASHER (STEEL)
●	P 34439	6	TUBING SLEEVE AND NUT
●	P 52409	6	CONNECTOR (BRASS) 1/4" TUBE x 1/8" NPT
●	P 56695	1	LINE CORD
●	L 2757	1	OPERATING INSTRUCTIONS
●	RP68 4441	20'	TUBING, 1/4"OD (POLYETHYLENE)
110	FU 5275	1	WIRE HARNESS (4 CONDUCTOR)
111	FU 5290	2	SWITCH
112	FU 5292	1	WIRE UNIT

NOTE: ▲ PART OF KEY NO. 37.

● NOT SHOWN, PLACED IN COMPARTMENT IN COVER OF CASE (KEY NO. 24).

WHEN ORDERING MATERIAL ALWAYS SPECIFY MODEL AND SERIAL NUMBER OF APPARATUS

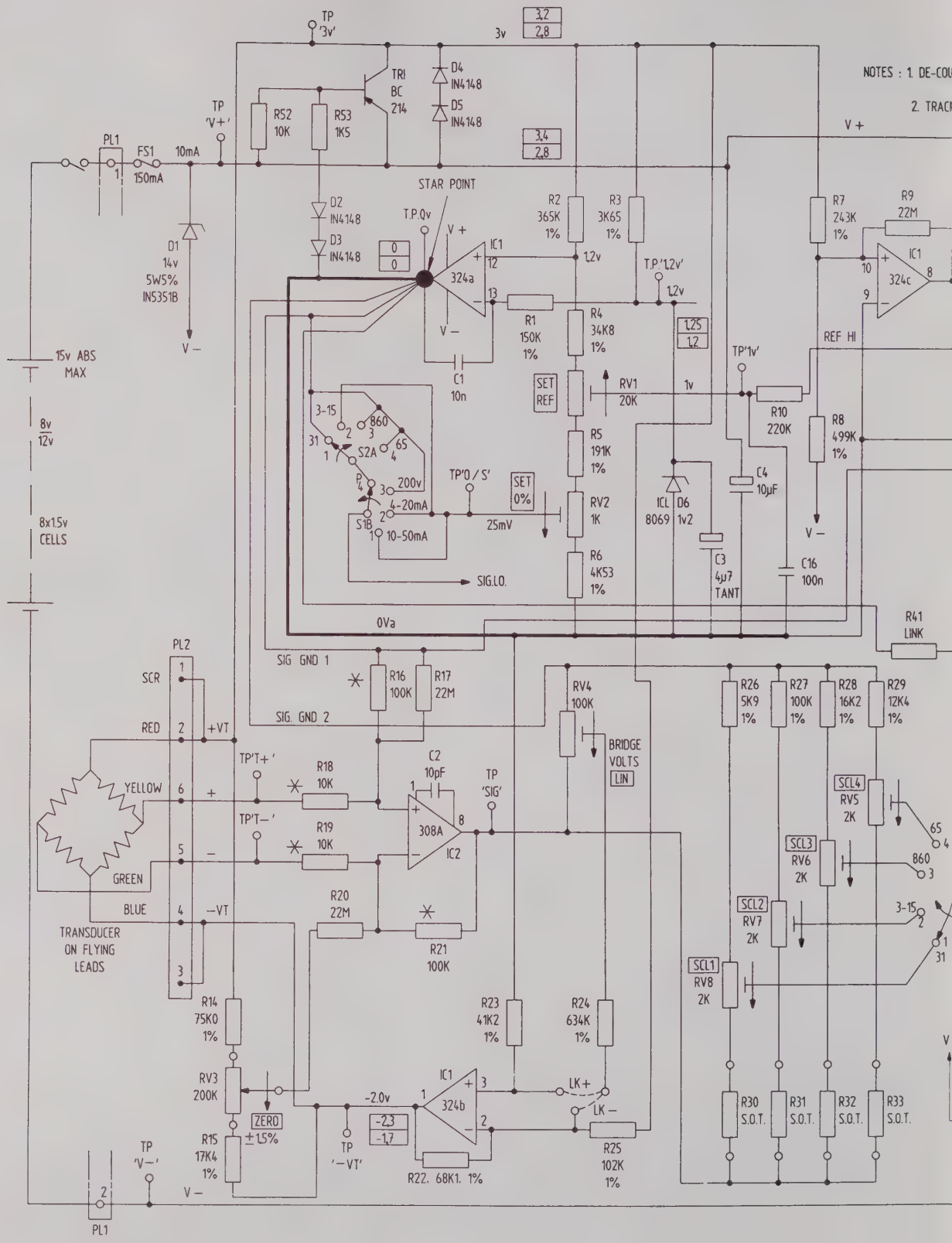
SERIES 65-125 ELECTRONIC PNEUMATIC CALIBRATOR - PARTS LIST

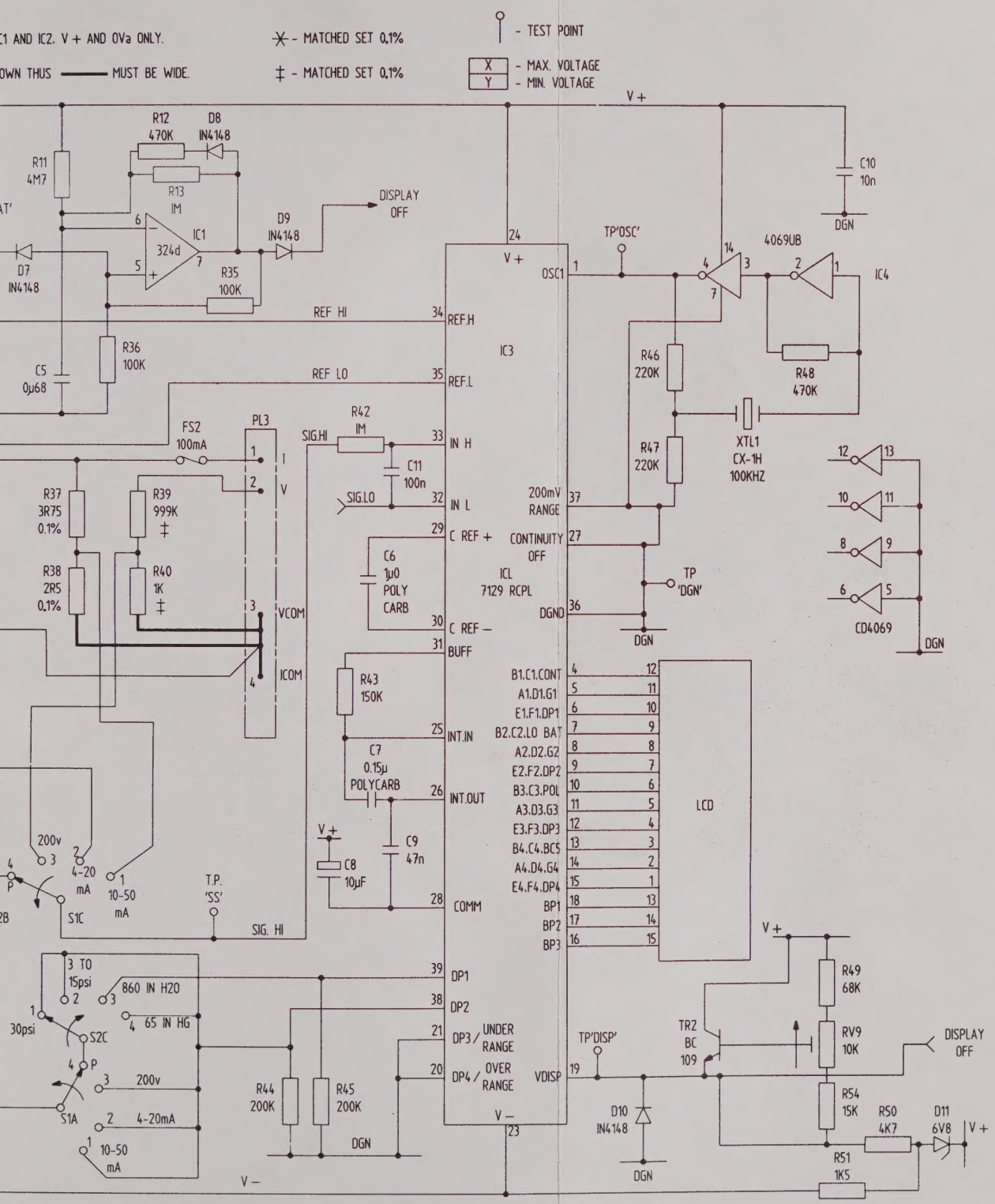


DISPLAY CIRCUIT BOARD CALIBRATION - SERVICE

650.125.150.020

ISSUE 0 10-91


NOTES : 1. DE-COU
2. TRACK
TP '3v'
3v
3.2
2.8
TR1 BC 214
D4 IN4148
D5 IN4148
TP 'V+'
V +
PL1
FS1 150mA
10mA
RS2 10K
RS3 1K5
3.4
2.8
STAR POINT
D2 IN4148
D3 IN4148
T.P.0v
V +
IC1
324a
0
0
R2 365K 1%
R3 3K65 1%
1.2v
T.P.'1.2v'
R7 243K 1%
R9 22M
IC1
324c
D1 14v 5W5% IN5351B
V –
15v ABS MAX
8v
12v
8x1.5v CELLS
C1 10n
R1 150K 1%
R4 34K8 1%
1.25
1.2
REF HI
TP'1v'
SET REF
RV1 20K
1v
R10 220K
R8 499K 1%
3-15
860
65
S2A
31
P4
200v
4-20mA
10-50mA
S1B
TP'0 / S'
SET 0%
25mV
R5 191K 1%
RV2 1K
R6 4K53 1%
SIG.LO.
ICL 8069
D6 1v2
C4 10µF
C3 4µ7 TANT
C16 100n
0Va
R41 LINK
PL2
SCR
RED
+VT
SIG GND 1
SIG. GND 2
R16 100K
R17 22M
RV4 100K
BRIDGE VOLTS LIN
R26 5K9 1%
R27 100K 1%
R28 16K2 1%
R29 12K4 1%
YELLOW
GREEN
BLUE
–VT
TP'T+'
TP'T–'
R18 10K
R19 10K
C2 10pF
308A
IC2
TP 'SIG'
SCL4 RV5 2K
SCL3 RV6 2K
SCL2 RV7 2K
SCL1 RV8 2K
TRANSDUCER ON FLYING LEADS
R20 22M
R21 100K
R14 75K0 1%
RV3 200K
ZERO ±1.5%
R15 17K4 1%
R23 41K2 1%
R24 634K 1%
IC1
324b
-2.0v
-2.3
-1.7
LK+
LK –
R25 102K 1%
R22. 68K1. 1%
TP '–VT'
TP 'V–'
R30 S.O.T.
R31 S.O.T.
R32 S.O.T.
R33 S.O.T.
PL1



FU5271 DISPLAY CIRCUIT BOARD - SCHEMATIC WIRING

650.125.155.020

ISSUE 0 10-91

MP MASTER
MA22019